

## DECORATIVE RELIEF FINISH PROCESS

## BACKGROUND OF THE INVENTION

The present invention relates to a decorative relief finish process. More particularly, it relates to a method of uniformly flattening or press-leveling excessive projections on the irregularly or unevenly roughened surface of an undercoat to a desired thickness to form a relief finish surface of desired decorative appearance.

Hitherto, decorative relief coatings having an irregularly or unevenly roughened surface have been formed by applying to a substrate such as a wall, for example, a spraying material or a coating material consisting mainly of coating composition, cement or plaster with a spray gun or a coating roller. These materials are used for undercoats as either primers of intermediate coating materials or as surfacers. The coated surface is ordinarily covered with a finishing topcoat. However, since these undercoats have irregular or uneven surfaces, it is customary to sand or polish or press excessive projections on the surface to level the thickness of the projections, thereby providing a more decorative topcoating or improving other functions of the uneven pattern, for example, to reduce the ability of the surface to be soiled.

There are largely two types of conventional methods of leveling excessive or unnecessary projections on an irregularly roughened topcoat surface. The first type is a method which involves sanding excessive projections with a sanding device after the coating is fully dried. The second type is a method involving rolling a roll made of rubber, Teflon, aluminum or stainless steel and having a smooth surface on the coated surface which is partially hardened by being left to stand for a few hours, the roll being wetted with a liquid which has an affinity with the spraying material or the coating material, i.e. the material is soluble in the liquid. Although the former method can provide a favorable finish when the coarseness of the sanding device is carefully chosen, this method has the disadvantages that it will usually take at least half a day, or during cold weather several days, for the coatings to become hardened sufficiently for sanding, and that dust is produced during sanding so that this method is undesirable from the sanitary point of view. This method requires fairly large amounts of manual work, and skilled laborers, and frequent changing of the sanding device due to clogging of the sanding device. The latter method, on the other hand, has the advantage that handling is simple, since it involves merely rolling a roller on the coated surface, without the formation of dust. However, this method also has disadvantages, in that the time required for rolling will be dependent upon the wetting condition of the roller since the roller tends to stick or adhere to the surface, and that a large amount of the surface material may become detached from the coated mass on the surface by adhering to the roller and then be transferred to another place, thereby causing fluff projections which impair the appearance of the decorative relief finished surface. This may also lead to a decrease in workability. Particularly, this conventional method has the disadvantage that when a wide area of the wall surface is treated, the roller has to be wetted a plurality of times during the treating operation. In another case, too, in which a two-pack hardenable epoxy resinous coating material is employed, the application of this method is inappropriate because the coating composition will rapidly become completely

hardened before it is possible to complete the treatment of the entire wide area of the uneven surface.

## SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to provide a relief finish surface of good decorative appearance. Another object of the present invention is to provide a method of forming a decorative relief surface having both flattened and roughened areas which have a desired decorative appearance. A further object of the present invention is to provide a method of forming the decorative surface by press-leveling or press-finishing top portions of projections on partially hardened surfaces of undercoats which extend a predetermined height with a particular pressing roller, such that the projections are uniformly flattened to a predetermined thickness and the rest of the projections are left unflattened. Other objects, features and advantages of the present invention will become apparent from the following specification, the accompanying drawings and the appended claims.

## BRIEF DESCRIPTION OF THE DRAWINGS

The present invention and particularly the method of forming a decorative relief surface having both uniformly flattened and roughened areas according to the present invention will best be understood from the following description of an embodiment thereof when read in connection with the accompanying drawings, in which:

FIGS. 1 and 2 are diagrams showing illustrative embodiments of uneven, decorative relief surfaces having uniformly flattened and roughened areas obtained by the method of the present invention;

FIG. 3a is a sectional view depicting a layer of undercoat on an object or substrate;

FIG. 3b is a sectional view showing the procedure of forming an uneven and irregularly roughened pattern on the layer of undercoat with a particular pattern-forming roller;

FIG. 3c is a sectional view depicting the procedure of flattening an uneven patterned surface with a pressing roller used for the present invention;

FIG. 4a is a sectional view illustrating the procedure of forming a different type of a coating on a substrate;

FIG. 4b is a sectional view showing the procedure of the present invention;

FIG. 5 is a schematic perspective view of a coating roller or a pattern-forming roll for providing an undercoat surface with a pattern; and

FIG. 6 is a schematic perspective view of a pressing roller to be used to level the surface of an undercoating according to the present invention.

## DETAILED DESCRIPTION OF THE INVENTION

The method of the present invention will be described in more detail with reference to the accompanying drawings. Referring now to FIG. 3a, a layer of undercoat 2 may be applied to an object or substrate 3 with a particular spraying device such as a spray gun or by coating them with a conventional roller coater. At this end, there may also be used a pattern-forming roll 4 as shown in FIG. 3b in which its surface is provided with a plurality of convex bodies, generally indicated by 4a, which are formed in a curved manner by continued, disconnected or perforated line shapes in a random manner and with the intervals between the convex bod-